

High Resolution Detector Work Group

Detector Types:

- Single Crystal
- Reflectrometer
- Beam Monitor
- Transmission Monitor

Targeted Specifications:

- 1.5 mm pixels or smaller
- Count Rates: 10^4 to 10^6
- High Detection Efficiency: ~50%
- Moderate to Small Area
- Gamma Insensitive

Semiconductor

- Film Coated
- Easy to couple
- Low disruption
- Radiation damage issue
- Size
- Stability
- Life-time?

Amorphous Silicon

- Inexpensive
- Slow
- Low pulse
- Large area
- Technology mature
- Capacitance
- Requires high voltage

MxP

- Near availability
- Readout speed
- High efficiency
- High spatial resolution
- Gamma background ($\ll 10^{-4}$)
- Fast
- Good pulse
- Easily shaped

Boron Carbide Device

- Nanocrystal – on 250 nm films
- preliminary data
- research- data not available on thick devices
- good efficiency (100%)
- good spatial resolution
- gamma rejection

Scintillators

- Inexpensive
- Radiation damage issue
- Fast
- High spatial resolution

Gas-Based Detectors

1. Micro Megas

- Easy to couple
- Low disruption
- Good count rate
- Stability as any gas detector
- Contamination issues
- 1mm x 1mm

Gas-Based Detectors

2. Multi-wire ^3He

- Wall effect
- Pressure trade-off
- Rate-slow
- 1mmx1mm
- promise of high throughput
- cost?
- recalibration

Gas-Based Detectors

3. Straw Tube

- Degradation
- B-coated
- Inexpensive
- Research
- Rate limited
- Proven technology for high energy physics

Recommendations

- Single Crystal Diffractometer
 - Scintillator
 - Anger
 - Deep Etched Pocket Scintillators
 - Amorphous Silicon/Semiconductor Tiling
 - MxP
- High Pressure Instrument
 - MxP
- Reflectrometer
 - Gas
 - MicroMegas
 - Pixel Gas Device
 - Straw Tube
 - Hybrid
 - MxP
 - Experimental Boron Compounds?
- Beam Monitor
 - Semiconductor
 - Microfission Chamber